

Review: A low-protein diet delays end-stage renal disease or death in stage 3 to 5 chronic kidney disease

Fouque D, Laville M, Boissel JP. **Low protein diets for chronic kidney disease in non diabetic adults.** Cochrane Database Syst Rev. 2006;(2):CD001892.

Clinical impact ratings: GIM/FP/GP ★★★★★☆☆ Nephrology ★★★★★☆☆

QUESTION

In patients with stage 3 to 5 chronic kidney disease (CKD), does a low-protein diet delay progression to end-stage renal disease (ESRD) or death?

METHODS

Data sources: Cochrane Central Register of Controlled Trials, Cochrane Renal Group Trials Register, MEDLINE, EMBASE/Excerpta Medica, conference abstracts from 3 nephrology associations, and authors in the field.

Study selection and assessment: Randomized controlled trials (RCTs) that compared severely or moderately reduced protein intake (0.3 to 0.6 g/kg per d) with standard protein intake (≥ 0.8 g/kg per d) in patients with moderate-to-severe CKD. Trials with diabetic patients or children were excluded. 8 RCTs (*n* = 1524, mean age range 48 to 62 y) met the selection criteria. Details of the

randomization process were obtained from authors of the included studies.

Outcomes: Need to start hemodialysis or peritoneal dialysis, kidney transplant, or death from any cause during follow-up.

MAIN RESULTS

Meta-analysis using a random-effects model showed that patients who received a low-protein diet had a lower risk for ESRD or death than did patients who received an unrestricted-protein diet (Table).

CONCLUSION

In patients with stage 3 to 5 chronic kidney disease, a low-protein diet delays progression to end-stage renal disease or death.

Source of funding: No external funding.

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Low protein vs unrestricted protein diet for stage 3 to 5 chronic kidney disease at 1 year*

Outcome	Number of trials (<i>n</i>)	Weighted event rates		RRR (95% CI)	NNT (CI)
		Low protein	Unrestricted protein		
End-stage renal disease or death†	8 (1524)	11%	19%	31% (14 to 44)	13 (8 to 50)

*Abbreviations defined in Glossary; weighted event rates, RRR, NNT, and CI calculated from data in article using a random-effects model.

†Need to start hemodialysis or peritoneal dialysis, kidney transplant, or death from any cause during follow-up.

COMMENTARY

Dietary protein restriction might delay onset of ESRD either by reducing the rate of progression of CKD or by reducing accumulation of the by-products of protein catabolism, thereby attenuating uremic symptoms. However, individual clinical studies of dietary protein restriction have not provided compelling evidence to routinely adopt this intervention for management of CKD.

In the meta-analysis by Fouque and colleagues, protein-restricted diets reduced risk for ESRD. This result was largely seen in trials comparing diets allowing only 0.3 to 0.6 g of protein/kg per day with unrestricted diets, suggesting a dose-response relation. Restricting dietary protein < 0.6 g/kg per day requires amino acid or keto acid supplements to prevent protein malnutrition and must be regarded as an intensive intervention that requires skilled dietitians. In the Modification of Diet in Renal Disease study, the average dietician time per patient was 3 hours per month during the first 4 months of the study and 2 hours per month thereafter (1).

Many of the studies included in this meta-analysis were done before current standards of blood pressure control or angiotensin-converting

enzyme inhibitor use were established, so the benefit of dietary protein restriction applied concurrently with these interventions would be less than that stated by the authors.

Finally, these are studies of patients with moderate-to-severe renal insufficiency, many of whom were proteinuric. Results may not be generalizable to patients with more modest renal insufficiency or patients without proteinuria.

For selected patients under vigilant observation, dietary protein restriction can be considered as an adjunct to other interventions to delay progression of CKD to ESRD.

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Reference

1. Dolecek TA, Olson MB, Caggiula AW, et al. Registered dietician time requirements in the Modification of Diet in Renal Disease Study. *J Am Diet Assoc.* 1995;95:1307-12.